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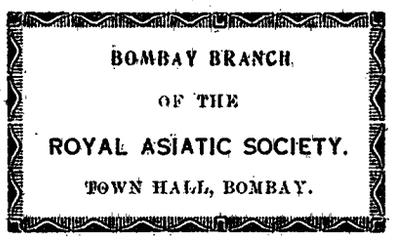
Dept. of Land Records and Agriculture, Repat
Bengal. 1887-88



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ANNUAL REPORT

OF THE

DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

BENGAL,

FOR THE YEAR 1887-88.

133031

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1888.
Price—8 *annas.*

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OFFICE OF DIRECTOR OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE, BENGAL.

No. 1487*Agri.*

FROM

E. W. COLLIN, ESQ., C.S.,

Offg. Director of the Department of Land Records and Agriculture, Bengal.

To

THE SECRETARY TO THE GOVERNMENT OF BENGAL,
REVENUE DEPARTMENT.

[THROUGH THE BOARD OF REVENUE.]

Calcutta, the 8th August 1888.

SIR,

I HAVE the honour to submit the Third Annual Report of the Department of Land Records and Agriculture for the year 1887-88.

2. Mr. Finucane was in charge of the Department throughout the year. The work of the Department consists of two main divisions—(1) that connected with Land Records and Settlements, and (2) that connected with Agriculture. In the Resolution of the Government of India recorded on the last Annual Report, it was said that the report on the first division should explain the executive action taken by the officer of the Department, and should not comprise discussions on administrative measures, nor give details of the results which have been obtained. With regard to the second division, it was said that the Agricultural section should be confined to a brief *resumé* of points of salient interest, and should avoid lengthy discussions on agricultural subjects and detailed examination of the results of experimental operations. In drawing up this report, I have endeavoured to carry out the orders of the Government of India.

CHAPTER I.

ORGANIZATION AND MAINTENANCE OF VILLAGE RECORDS.

3. THE work done during the year in connection with the organization and maintenance of village records consisted in the supervision of the surveys and settlements of the following Government, Wards' and private estates. The total area of lands, the survey and settlement of which was supervised by this Department, was about 3,000 square miles, scattered over the whole of Bengal. The following is a statement showing concisely the operations of the year:—

Statement of Surveys and Settlements in Bengal during 1887-88, *with particulars regarding their areas, cost, and method of survey.*

Division.	District.	Name of estate.	Area in acres.	Whether surveyed by professional agency or not.	Area cadastrally surveyed up to 31st March 1888 in acres.	Cost of survey per acre.	Remarks.
GOVERNMENT ESTATES.							
Orissa	Tributary mehals of Orissa.	Angul	563,840	Professional ...	119,680	6½ annas...	The cost will be materially reduced on completion of area. This represents initial charges, traverse survey charges, &c.
Do.	Cuttack	Banki	76,800	Ditto ...	3,840	9½ „ ...	Ditto ditto.
Chittagong... ...	Noakholly	Nulchera	18,211	Non-professional...	.....	8¾ „ ...	Settlement completed. This is total cost for survey and settlement.
Presidency... ...	24-Pergunnahs ...	Bhil Bullee	6,106	Ditto ...	6,106	9¾ „ ...	Ditto ditto.
Ditto	Sunderbuns	Port Canning	6,600	Ditto ...	6,000	Not known.	
Burdwan	Midnapore	Bhetia	3,650	Ditto ...	3,650	.....	Cost of operations Rs. 2,400 including cost of previous measurements in 1882.
Chittagong ...	Tipperah	Juar Baluakandi ...	2,740	Ditto ...	860	3 annas	
Burdwan	Midnapore	Kamina Chuck ...	703	.....	.....	.....	Taken in hand at the end of March.
WARDS' ESTATES.							
Bhagulpore and Patna.	Bhagulpore, Monghyr, Purneah, Maldah, and Durbhunga.	Srinagar-Banaili ...	512,000	Professional ...	275,000	3¾ annas...	Including traverse survey of 435 square miles.
Rajshahye	Dinagepore	Sunkerpore	180,000	Ditto ...	168,000	6 „	
Ditto	Ditto	Chooramon	52,910	Non-professional...	31,126	5½ „	
Ditto and Bhagulpore.	Ditto and Purneah	Maldwar	104,960	Professional ...	27,200	5 „	
PRIVATE ESTATES.							
Rajshahye	Rajshahye	Dubalhati	31,870	Non-professional...	.....	.....	Cadastral survey did not commence till after 1st April 1888.
Burdwan	Midnapore	Kesiari	4,818	Ditto ...	2,960	4½ annas...	Excluding cost of instruments.
Ditto	Ditto	Purbopitpore *alias* Purgopalpur.	903	Ditto ...	139	3 „ ...	Ditto ditto.
Ditto	Ditto	Purusthrampore ...	477	Ditto ...	160	3 „ ...	Ditto ditto.
Ditto	Ditto	Bogri	366	Ditto ...	80	5¼ „ ...	Ditto ditto.
Chittagong... ...	Tipperah	Alakdia Durgapur ...	774	.....	.....	.....	

Government Estates.

I.—Angul Estate.

4. The Government estate of Angul lies within the Tributary Mehals of Orissa. The circumstances under which it was decided to survey and re-settle the estate were described on page 5 of the annual report of this Department for 1886-87. The estate is now found to comprise 503 square miles of revenue-paying lands, 138 square mile of revenue-paying jungle, and 240 square miles of forest reserve. The revenue-paying tracts are being surveyed cadastrally on the scale of 16 inches to the mile, and the forest tracts on the 4-inch scale. As explained in the report referred to above, it was decided to carry out the cadastral survey through the indigenous agency of sarbarakars or village headmen and their nominees.

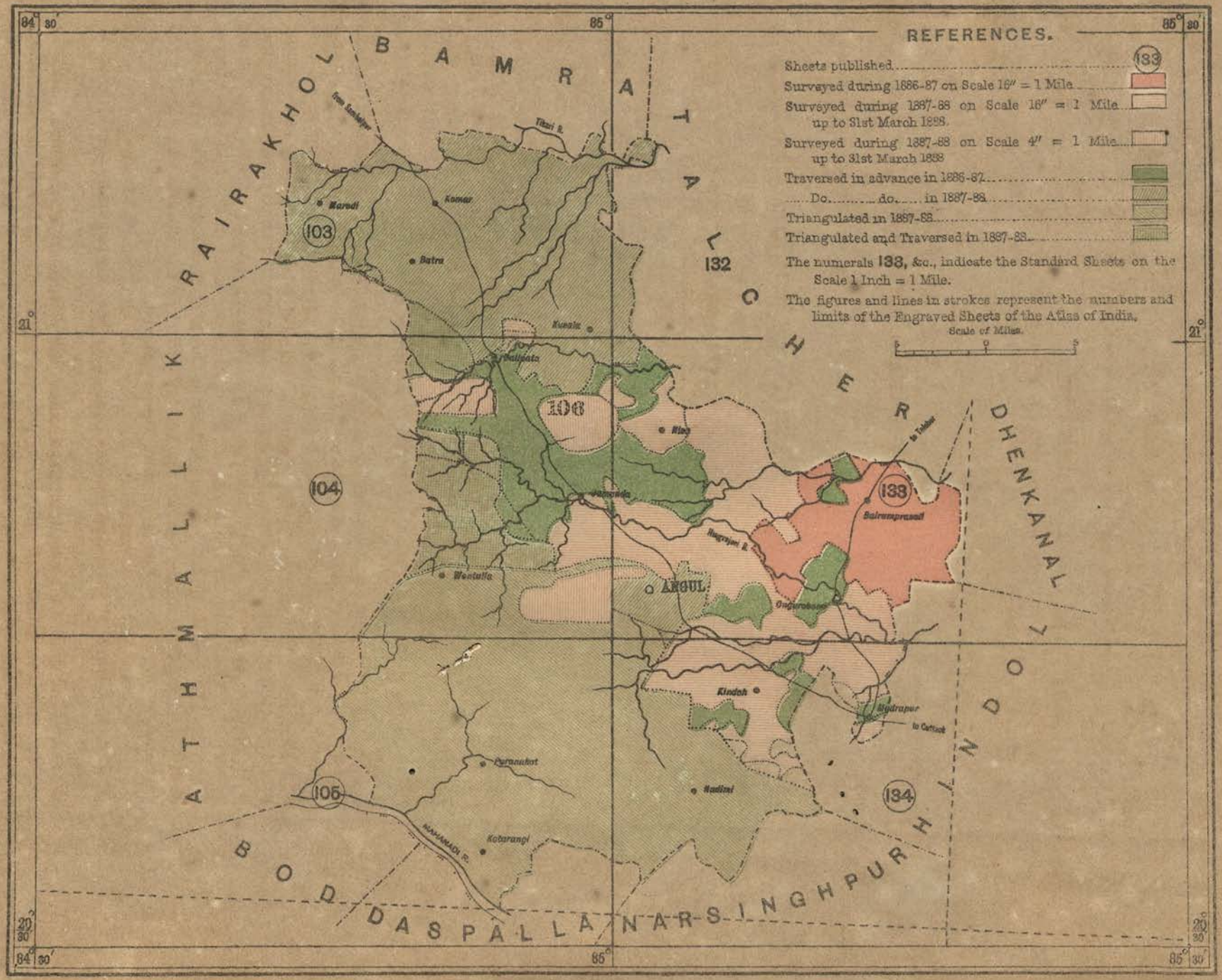
5. Some delay occurred in carrying out the change of surveying staff, and at one time all work in connection with the survey was transferred to the Settlement Department, which is placed under the local tehsildar and Mr. A. K. Raye, a Cirencester graduate. The work was, however, shortly afterwards retransferred to the Survey Department, which had in the meantime trained a large body of sarbarakars, and was prepared to carry on the work with this agency.

6. The number of villages in the estate is 618, the boundaries of which had been demarcated by the close of the year. There were 133 disputed

INDEX TO THE CADASTRAL SURVEY IN THE ANGUL GOVT. ESTATE

Showing the State of the Work up to 31st March 1888.

No. 8 PARTY.



PHOTOZINCOGRAPHED AT THE SURVEY OF INDIA OFFICE, CALCUTTA, AUGUST 1888.

District OF CUTTACK

Scale 1 Inch = 8 Miles.

10 5 0 10

NOTE.

Area in Square Miles.....3,617.

Population in 1881.....1,738,165.

REFERENCES.

District	CUTTACK
Sub-Division	KENDRAPARA
Thana or Police Station	Jagatsingpur
Town	Agrahat
Main Road	
District Boundary	
Sub-Division do.	
Canal	

Area in green traversed up to 31st March 1868.

Do. pink Cadastrally Surveyed up to 31st March 1868.

PHOTOZINCOGRAPHED AT THE SURVEY OF INDIA OFFICE, CALCUTTA, AUGUST 1868.

boundaries of which 92 had been disposed of. In addition to this 191 miles of exterior boundary had been demarcated and cleared.

7. The cadastral survey of 61½ square miles had been completed during the year 1886-87, and up to the 31st March 1888 the cadastral survey of 187 square miles was completed. In addition to the area cadastrally surveyed, a considerable portion of the forest tracts had been surveyed on the 4-inch scale. The outturn of work is disappointing, but it must be remembered that the survey was done by new and inexperienced men. They had to be trained, and their rate of progress, at first, was necessarily slow, especially in the short days of the first months of the year. Since April the total area cadastrally surveyed had increased to 393 square miles. No complaints have reached me of any obstruction or inefficiency in the sarbarakars, and the results of the experiment of depending solely upon indigenous agency cannot be considered unsatisfactory. It is to be remembered that the work is done by these men at a contract rate of Rs. 4 per 100 acres, which includes the pay of the chainmen and coolies, and thus the charges for mere surveying are reduced by about Rs. 10 per square mile, while a trained body of local officers is left, capable of maintaining the maps and records.

8. The cost of survey, including traverse survey, was approximately Rs. 49,000 up to the 31st March, or about 6½ annas per acre. The cost, however, by the end of May had been reduced, in consequence of the additional area surveyed, to 4¼ annas per acre. If, as anticipated by the Deputy Superintendent of Survey in charge of the survey party, this rate of cost is maintained, the total cost of survey will not exceed one lakh of rupees. It was stated in the last annual report of this Department, that if the professional department were unable to complete the cadastral survey of the entire tract during the season 1887-88 at a moderate cost, the supervision of the survey should be undertaken by the Settlement Department. As stated above, 110 square miles have been left incomplete, and I propose to consider the advisability to transferring the work which remains for next cold season, in the course of a visit which I intend making to Cuttack next month.

9. The progress in settlement work has been slow. This work is being conducted under the old settlement regulations, and several important points regarding the status of raiyats and rates of rent had to be determined by the Board of Revenue before settlement work could be regularly taken up. The records of only 80 villages which were surveyed in the season 1886-87 were made over to the Settlement Department. No records of villages surveyed in the present year have been received.

10. The 80 villages comprise 61½ square miles, and though it has not been possible to complete the records of rental and status, the entries made by the Survey Department have been attested and verified, and disputes have been settled. Thus 451 disputes as to possession and 45 disputes as to rent-free tenures have been disposed of. It has been decided to make no alteration in existing rates, but to rely upon the increase in the area of holdings and the extension of cultivation for an increase in the revenue of the estate.

11. The cost of settlement operations up to the close of the year was Rs. 16,722. It should be mentioned that the cost of survey includes the charges of the training school, which amount to Rs. 4,949. The total cost of the operations is estimated at Rs. 1,95,000.

II.—Banki Estate, Cuttack.

12. This estate came under the direct management of Government in 1843 owing to the Rajah having been sentenced to imprisonment for life. The estate was first placed under the Superintendent of the Tributary Mehals, but in 1882 it was annexed to Cuttack, and was brought under regular administration by Act XXV of 1881. The estate was settled in 1844 for ten years, and again in 1854 for fourteen years. The latter period was extended in consequence of the Orissa famine to 1888. It was resolved last year to make a complete survey and settlement, partly in the hope of increased revenue from extended cultivation, and partly to readjust the assessment on parts of the estate where lands had deteriorated owing to inundations.

13. The area of the estate is 120 square miles. The outer boundaries of villages were surveyed by a detachment of the professional party in Angul, and

it was determined to carry out the cadastral survey with the agency of sarbarakars, as in the case of the Angul estate, trained and supervised by the professional party. The settlement work was given to Babu Bolaram Dass.

14. The work commenced in December 1887, and the outer boundaries of all villages and the traverse survey of the whole area was completed by the end of the year. Some time had to be spent in training the sarbarakars. One hundred and thirty of these local agents or their nominees came forward and were trained at a cost of Rs. 3,558. Cadastral survey of 6 square miles was completed by the end of March, and the whole area was finished by the end of the survey season. No records were received during the year by the settlement officer.

15. The total cost of survey, including the training school and traverse survey, was Rs. 5,831. The estimated cost of the whole operations is Rs. 40,000, which sum will be provided from savings in the original estimate of the cost of survey and settlement in the Angul estate.

III.—Nulchira Chur Estate.

16. The circumstances which led to the survey and settlement of the Nulchira Chur estate under the provisions of the Tenancy Act were fully explained in the annual report of this department for 1886-87. The settlement operations were concluded in February 1888, but it is not yet known if the former settlement-holders have accepted the terms offered them.

17. The total area of the estate is 18,211 acres, or 28½ square miles, of which 72 per cent. is cultivated, 16·5 per cent. is cultivable, and 11·5 per cent. is non-culturable. The total area has increased since the resumption of the estate in 1838 by 4,478 acres. The land is held by 1,354 tenants, who have been classified as follows:—

Tenure-holders	169
Under-tenure-holders	8
Settled raiyats	532
Non-occupancy raiyats	527
Under-raiyats	108

These figures represent the number of interests or holdings, but as there are many co-sharers in each tenure or holding, the number of tenants is much larger; thus the average size of a tenure is about 10 acres, that of the holding of a settled raiyat is 5 acres, and of a non-occupancy raiyat, 4 acres. The average area held by an under-raiyat is 2½ acres.

18. Rents have been settled at the following rates:—

	Rs.	A.	P.	
Settled and non-occupancy raiyats at	1	4	0	per bigha.
Privileged raiyats at	0	12	0	„
Tenure-holders at	0	10	9⅗	„

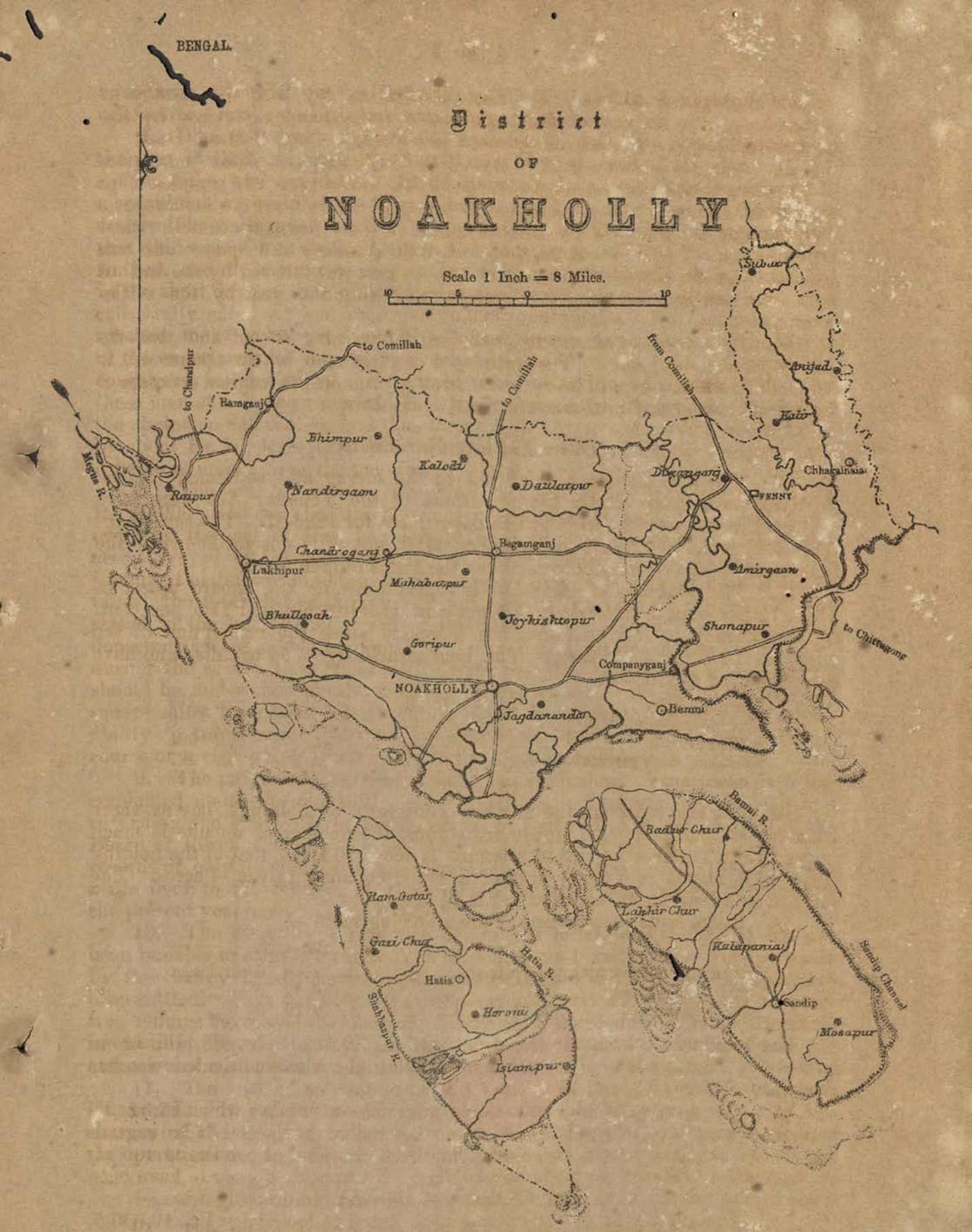
The rent-roll of the estate has risen from Rs. 22,422 to Rs. 28,413, or an increase of 26 per cent. The average rental on the whole cultivated area has risen from 7 annas 7 pie to 11 annas 5 pie per acre.

19. The number of objection cases was 192—a number which cannot be considered excessive. Some appeals were preferred to the Special Judge regarding the status of the tenant, those who had been classified as privileged raiyats in some cases claiming to be tenure-holders. No appeals appear to have been made by the raiyats on the ground that the rents were improperly assessed.

20. The total cost of the operations is stated to have been Rs. 10,059-8, or at the rate of 8 annas 9 pie per acre for survey and settlement. As the operations have resulted in an increase of Rs. 6,000 in the rent-roll of the estate, and the settlement has been pending for various reasons for 19 years, the satisfactory conclusion of these operations is creditable to the settlement officer, Munshi Nundji, and a proof of the beneficial effects of the application of the provisions of the Tenancy Act.

IV.—Bhil Bulli Estate.

21. The survey and settlement of the Bhil Bulli estate was concluded during the year. The estate is portion of a reclaimed marsh, which became Government property by resumption in 1830. The land on the edge of the



REFERENCES.

District.....○NOAKHOLLY

Sub-Division.....□ PENNY

Thana or Police Station....○Begamganj

Town.....●Goripur

Main Road.....

District Boundary.....

Sub-Division do.....

The part coloured shows the completion of the Settlements of Chur Nulchera during the year ending 31st March 1888.

NOTE.

Area in Square Miles.....1,641.

Population in 1881.....820,772.

PHOTOZINCOGRAPHED AT THE SURVEY OF INDIA OFFICES, CALCUTTA, AUGUST 1888

marsh was permanently settled in 1858, but the central portions were let as a fishery till 1874. Measures were then taken through the Public Works Department for the improvement of the estate, and a drainage scheme was carried out at a cost of Rs. 94,443.

22. The survey began in 1886, and at the beginning of 1887, it was ordered that the settlement should be carried out under the Tenancy Act. The settlement operations were brought to a close in March 1888. The total area of the estate is 6,106 acres, of which only 84 acres are unculturable. The lands are divided among 1,928 raiyats, who are classified as follows:—

Tenure-holders	...	17	Occupancy raiyats	...	27
Settled raiyats	...	73	Non-occupancy raiyats	...	1,811

The large number of non-occupancy raiyats is due to the fact that the lands have been only recently reclaimed, and the tenants admitted to occupancy.

23. Rents have been settled at progressive rates, rising from annas 12 to Re. 1-8 per bigha in four years. The rents, when they have reached the maximum in 1289, will have increased from Rs. 4,061 (the total rental of the estate from 1875 to 1886) to Rs. 27,059. This large increase of rental is mainly due to the improvements effected by the drainage works of the Public Works Department.

24. The survey and settlement operations were carried out by Babu Sachida Nanda Mookerjee, Sub-Deputy Collector, at a cost of Rs. 3,675, or 9 annas 9 pies per acre. The financial results of the settlement must be considered satisfactory.

V.—Port Canning Estate.

25. This estate consists of Sunderbuns grant No. 54 and the reserved portion of grant No. 50. The area is estimated to be 6,600 acres. The estate had been surveyed at some previous time, but no records existed, and the map which was prepared had nothing to indicate when and by whom it was prepared. A survey and settlement under the Tenancy Act was accordingly ordered in April 1887, and Mr. J. Ellison, the Deputy Collector in charge of the Sunderbuns, was appointed to carry out the work.

26. Measurements could not commence before January 1888, and by the close of March were almost concluded. Settlements of rent did not commence until the current year. The raiyats appear to have given trouble by their opposition to the survey.

VI.—Bhetia Estate, Midnapore.

27. This estate comprises 23 villages with an estimated area of 3,650 acres. The revision of the assessment commenced in 1882, but was delayed by the claims of certain parties to be considered raiyats in opposition to the claims of the actual cultivators. Their claims were set aside, but in 1884 it was decided to let the settlement stand over till the passing of the Tenancy Act. In 1886 Government sanctioned the survey of the estate and the preparation of a record of rights under the Tenancy Act. An increase of rental on account of rise of prices and of extension of cultivation is anticipated. At the close of 1887 the supervision of the survey was placed under this department.

28. Babu Kedarnath Banerjee, Sub-Deputy Collector, was in charge of the operations until his transfer in February 1888, and no settlement officer was appointed in his place until May. The lands having been measured in 1882, the whole estate was not remeasured, but it was ordered that the measurement should be carefully tested with a view of bringing under assessment the additional lands brought into cultivation since the recent measurement. With this object 360 acres were surveyed during the past year, and the measurements of the remaining area were tested. The record of rights was also prepared for the whole estate, and the process of attestation was commenced. There were 168 disputes, of which 128 had been disposed of under section 106 of the Tenancy Act.

29. The cost of the operations during the year was Rs. 595, and including the cost of the previous measurements in 1882, the charge for survey and the partial preparation of the record of rights has been Rs. 2,400. Settlement of rents had not commenced before the close of the year.

VII.—Juar Baluakandi, Tipperah.

30. This is a tenure in the 8-anna share of pergunnah Burdakhal. The pergunnah is temporarily settled. It was ordered to be surveyed and settled under the Tenancy Act, as there appeared to be evidence sufficient to support a demand for enhanced rent on the ground of the rise of prices. The area of the tenure is about 2,740 acres. Measurements were commenced in February 1888 under Babu Kali Sunker Sen, Deputy Collector, and at the close of the year 860 acres had been surveyed at a cost of Rs. 140.

VIII.—Kamini Chuck, Midnapore.

31. This estate comprises 703 acres, and the order notifying its survey under the Tenancy Act was issued on the 15th January 1887. The settlement officer was not, however, appointed till the end of November last, and he reports that, owing to the flooded state of the lands, survey could not be taken in hand till the end of March.

SURVEY AND RECORDS OF RIGHTS IN WARDS' ESTATES.

I.—Srinagar Court of Wards and Baneli Raj Estate.

32. The total area of these estates is estimated to be 800 square miles, distributed over the districts of Bhagulpore, Monghyr, Purneah, Maldah and Durbhunga. Of the total area, the whole except about 72 square miles is held jointly between the Srinagar minors and the Rajah of Baneli. The estate has been for about five years under the Court of Wards, but the rent-roll had been reduced to such a state of confusion that it was found impossible to establish order without a survey and record of rights. The current demand of the wards' share is stated to be Rs. 2,84,920, of which Rs. 1,82,068 were collected in the year 1886-87, and the balance outstanding was over 7 lakhs of rupees. The co-sharer, the Rajah of Baneli, joined with the Court of Wards in applying for a survey, and the necessary notification under section 101 of the Tenancy Act was issued on the 31st October 1887.

33. The Survey of India Department supplied a party under Mr. G. B. Scott for the traverse and cadastral survey, while the settlement operations were placed under myself with Babu Burhandeo Narain, Deputy Magistrate, and Mr. D. L. Roy a Cirencester graduate, as assistant settlement officers. A portion of the estate, comprising about 80 square miles, was given to the Settlement Department to survey as an experiment. Boundary survey was commenced in October and cadastral survey in December. Work was at first hindered by the flooded state of the country and the necessity of training local men as amins. It may be mentioned that these locally trained men turned out failures as a rule, and had to be replaced by trained amins from other survey parties and by men who had worked in the Mozufferpore survey.

34. The following is a statement of the work completed up to the 31st March 1888:—

The boundaries of all villages in Bhagulpore and Monghyr, amounting to 325, were demarcated. There were 118 boundary disputes, of which 16 had been decided by the close of the year. It has been found that about 30 per cent. of the boundary disputes at first reported in Bhagulpore were not pressed after cadastral survey. The disputes in Monghyr are of a more serious nature and will be taken up next cold weather.

The area of traverse survey completed up to the 31st March was 435 square miles, comprising all the villages in the estates in Bhagulpore and Monghyr.

The cadastral survey of 164 square miles was completed by the end of the year, of which 131 square miles were surveyed by the Survey Department, and 33 square miles by the Settlement Department. It is satisfactory to note that before the field season ended the cadastral survey of 430 square miles, including nearly the whole of the area in Bhagulpore and Monghyr, had been completed.

Little was done in the direction of record of rights and settlement of rents during the year under report. The records of 35 villages, comprising

BENGAL.

District
OF
BHAGALPUR

Scale 1 Inch = 8 Miles.

10 5 0 10 20 30

NOTE.

Area in Square Miles.....4,268.

Population in 1881.....1,966,158.

BANELI AND

Progress on

Survey Completed

Do. ...in Progress

Do. ...in Progress

ROYAL ASIATIC SOCIETY. LIBRARY OF THE BOMBAY BRANCH OF THE

REFERENCES

District.....OBl

Sub-Division.....□Mt

Thana or Police Station....oKi

Town.....•Ra

Main Road.....

District.....Boundary.....

Sub-Division do.....

Railway opened.....

Do.....under construction

PHOTOZINCOGRAPHED AT THE SURVEY OF INDIA OFFICES, CALCUTTA. AUGUST 1888.

133031

District OF MONGHYR

Scale 1 Inch = 8 Miles.

10 5 0 10

NOTE.

Area in Square Miles ..... 3,927.

Population in 1891 ..... 1,959,774.

REFERENCES.

District	MONGHYR
Sub-Division	SEGOO SERAI
Thana or Police Station	Gogri
Town	*Majhauli*
Main Road	
District Boundary	
Sub-Division do.	
Railway	

The coloured portion represents the Estates under survey, the completion of Cadastral Survey of which is expected by close of field season.

PHOTOZINCOGRAPHED AT THE SURVEY OF INDIA OFFICE, CALCUTTA, AUGUST 1893.

an area of 33 square miles, were made over to the Settlement Department. The rents were recorded and status determined of 1,760 raiyats, who were classified as follows:—

Tenure-holder	1
Settled raiyats	1,184
Non-occupancy raiyats	220
Under-raiyats	355

35. In settling rents an increase was claimed by the landlord on the ground of increase in the area of the holdings. An attempt was made to introduce a system of settlement by amicable arrangement, the landlord making a concession on account of the excess areas, and the raiyats accepting assessment of the balance of the excess. Thus in the case of the 1,760 raiyats, the former rent demand was Rs. 2,834, and the rent settled was Rs. 3,175, showing an increase of 12 per cent. A further claim for enhanced rent was made in the case of raiyats claiming to hold at privileged rates as jeth raiyats. It was found that these men had obtained temporary remission of rent from lessees for whom they had performed certain services, but that such remissions were not of a permanent character, and their rents were enhanced up to the prevailing rate.

36. The confusion in the estate appears to have arisen chiefly from the system of leasing out the villages, which prevailed before the estate came under the Court of Wards. The lessees had raised the rates chiefly by the addition of cesses or the incorporation of them into the rent. The nominal demand thus created had been irregularly paid, and, when the villages came under direct management, could not be collected. In other villages lands had never been measured, and raiyats had been allowed to extend their holdings on payment of an increase on their lump rentals. The new system of rent-receipts introduced by the Tenancy Act brought matters to a head, as the raiyats feared to accept the receipt forms lest they should be bound to the rents and rates claimed by the landlords, but hitherto never accepted by the tenants. The settlement officer reports that the manager of the estate has done nothing to set matters right. He has never visited the villages, nor attempted to learn what were the grievances of the raiyats. The latter were left to the putwaris, who had charge of the collections, and whose accounts were never verified. Accounts were not settled up, and thus imaginary arrears bearing interest accumulated year by year. The manager does not even now take any personal share in the work of settlement, and only once visited the settlement officer's camp for a few days. The Collector writes that he entirely agrees in this condemnation of the manager.

37. It is too early to speak positively regarding the costs of the operations. The total estimate is Rs. 2,40,191. Up to the 31st March Rs. 37,561 had been expended, of which Rs. 26,567 were charges of the Survey Department and Rs. 10,964 charges of the settlement officer, including the survey of 33 square miles. Mr. Scott states the cost of traverse survey to be Rs. 25 per square mile, and the cost of cadastral survey 3 annas 8 pie per acre. He hopes to reduce this cost to 3 annas per acre, but the scattered character of the estate makes the work somewhat costly. A considerable saving also might be made if the estate would utilize the menial servants of the villages to assist as chainmen and coolies and would insist on a regular attendance of putwaris and jeth raiyats. The putwaris of the estate are now being trained in survey work to enable them to correct the maps and maintain the records in future.

II.—Sunkerpore Wards' Estate, Dinagepore.

38. The circumstances which led to the survey of this estate were described on page 7 of the Annual Report of this Department for 1886-87. The estate comprises an area of 270 square miles, or, including portions of the estate interlaced with the lands of other estates, 275 square miles. It is the property of the Sunkerpore wards and three co-sharers. The survey continued under a professional party of the Survey of India Department, and the settlement was under Babu Shoshi Bhushun Dutt, Sub-Deputy Collector.

39. The estate contains 1,068 villages, scattered over the Dinagepore, Maldah, and Rajshahye districts. The demarcation of village boundaries was carried out by the manager of the estate through the village headman.

Tri-junctions of villages were permanently marked with stone prisms. There were only 47 boundary disputes, of which 37 have been disposed of.

40. The traverse survey of the whole estate was completed, and 63½ square miles were cadastrally surveyed. Thus, including the work done last season, *i. e.*, up to June 1887, the cadastral survey of 262½ square miles out of 275 square miles had been completed during the year. The survey of the whole area was finished before the season closed. The total expenditure up to the 31st March on survey was Rs. 66,501, or at the rate of 6 annas per acre. The cost appears to me to be excessive, and, in addition, the Settlement Department have been delayed by the non-receipt of records and by inaccuracies in the entries. It is possible that the scattered condition of the estate may have added to the cost, but as a set-off against this it is to be noticed that the percentage of uncultivated land is high. The experience of this survey confirms the opinion expressed in the annual report of last year, that in undertaking future surveys, it must be considered whether it is not advisable to confine the operations of the professional department to traverse survey alone, and to carry out the cadastral survey through the settlement officers. The experience gained in the Srinagar estate shows that this system can be successfully carried out.

41. No records were received until the end of last July, when the complete records of 15 villages and records of 71 villages without maps were made over to the settlement officers. Up to the 31st March the records of 444 villages, comprising an area of about 125 square miles, had been received. Villages in this estate are, however, arranged in circles, and the records of 27 circles only, comprising 197 villages, could be taken in hand.

42. The work of attestation was at first placed under the manager of the estate with a special staff, who had also to prepare rate reports according to the classification of the lands. The work proceeded slowly and unsatisfactorily, and was placed under the settlement officers at the close of the year.

43. The total number of raiyats whose status was determined during the year was 3,061, who were classified as follows :—

Tenure-holders	72
Raiyats at fixed rents	3
Settled raiyats	1,258
Occupancy raiyats	3
Non-occupancy raiyats	1,236
Under-raiyats	489

44. The large number of non-occupancy raiyats is stated to be due to the ease with which land is obtainable in the district, which induces raiyats to shift their holdings. This shows the value of a survey for purposes of management, as without maps it would be difficult to ascertain when and where new lands had been taken up.

45. Very little progress has been made in the settlement of rents, and it is reported that rents, amounting to Rs. 1,797 only, have been settled, giving an increase on the former rental of over 15 per cent. The increase is due to the resumption of invalid rent-free holdings, to the assessment of extended cultivation, and the re-adjustment of rentals according to the revised classification of lands. Progress is said to have been retarded by the delay caused by the necessity of preparing rate reports, and the difficulty of arranging the terms of amicable arrangement for settlement of rents which should be satisfactory to all parties and avoid the necessity of litigation. The preparation of these rate reports was afterwards abandoned, and the settlement officer now acts upon the joint application of the manager of the wards' estates and the co-sharer, Dhunput Singh, and makes a settlement by suggesting terms of compromise to the parties. Under this system he has succeeded in satisfying the parties without resort to litigation, and it is hoped that settlements will now proceed more rapidly. It will be a great point gained if the system of settlement of rents by amicable compromise can be followed out. The cost of the settlement operations was Rs. 12,898 up to the close of the year.

46. A survey school has been started at Maldwar for training putwaris of the different wards' estates in Dinagepore and local men who may be required for future survey operations. The expenses to the end of the year amounted to about Rs. 3,000. But the attempt to train putwaris has not hitherto been successful, as only 15 of these men have received certificates of efficiency.

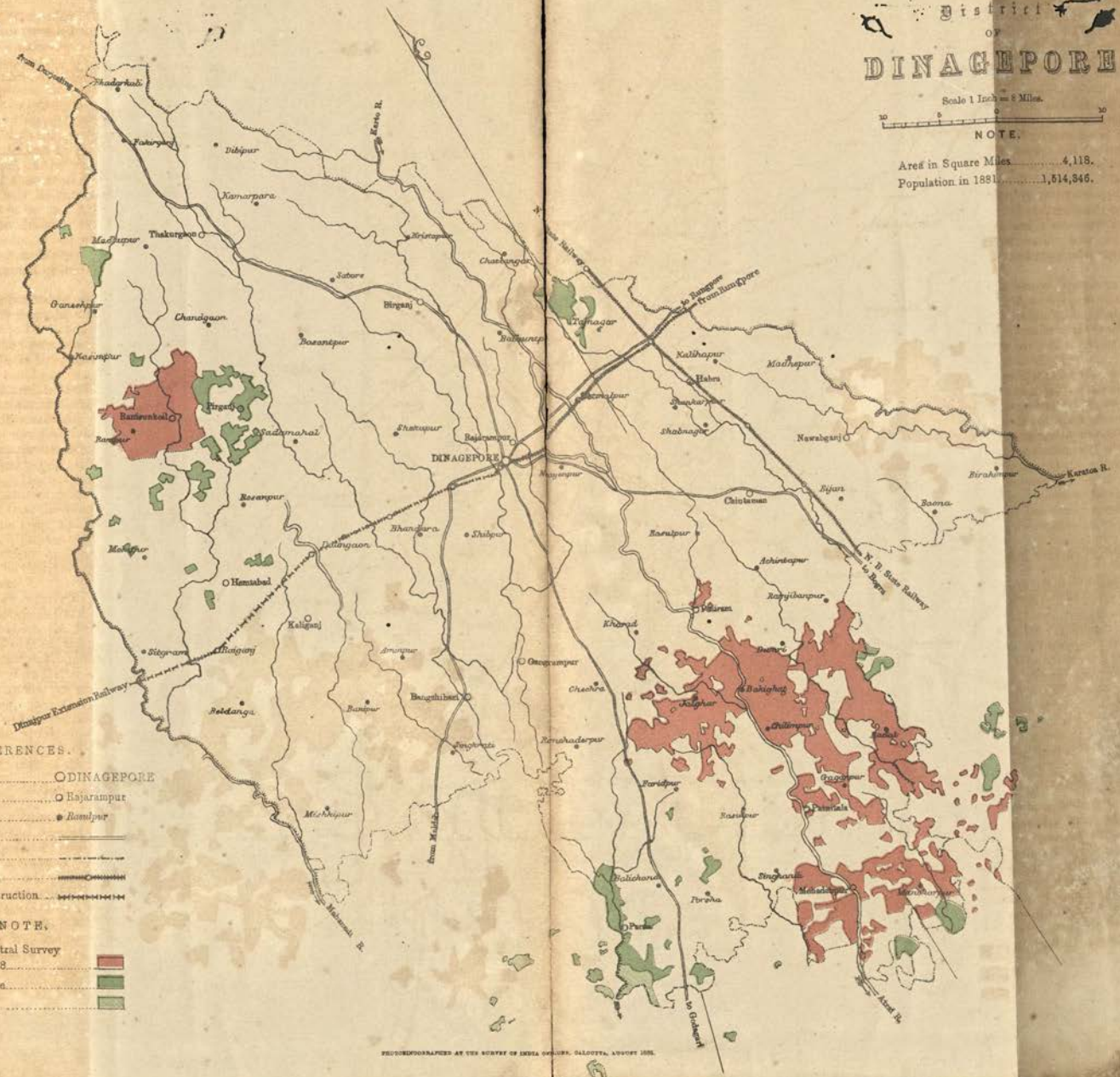
District OF DINAGEPORE

Scale 1 Inch = 8 Miles.

10 5 0 10

NOTE.

Area in Square Miles.....4,118.
Population in 1881.....1,514,346.



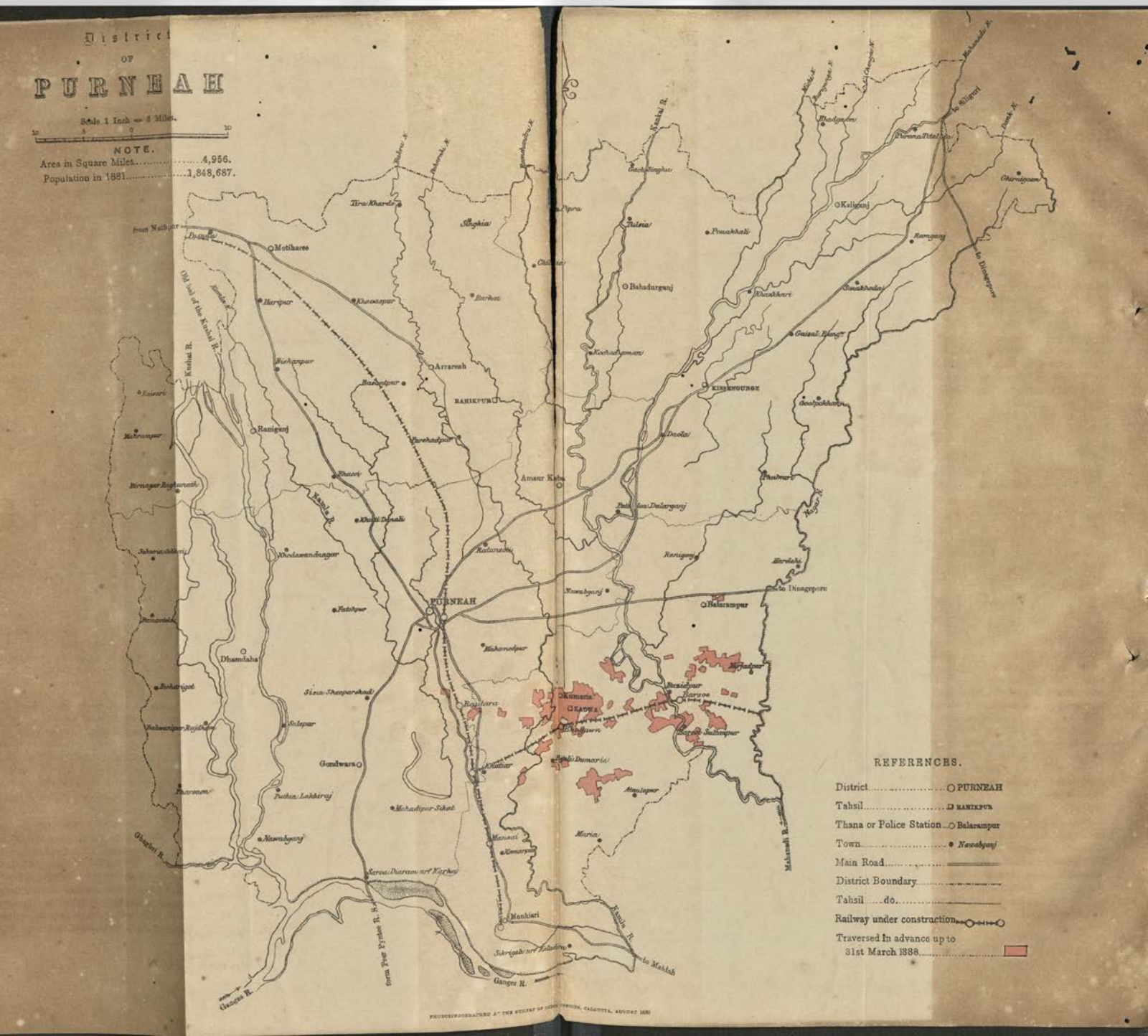
REFERENCES.

District	DINAGEPORE
Thana or Police	Rajarampur
Town	*Ramipur*
Main Road	
District Boundary	
Railway opened	
Do. under construction	

NOTE.

Completed in Cadastral Survey to 31st March 1888	
Traversed in advance	
Remaining	

PHOTOZINCOGRAPHED AT THE SURVEY OF INDIA OFFICE, CALCUTTA, AUGUST 1888.


District
OF
PURNEAH
Scale 1 Inch = 8 Miles.
10 5 0 10
NOTE.
Area in Square Miles.....4,956.
Population in 1881.....1,848,687.
Motiharee
Haripur
Khaosapur
Arrareah
RANIKPUR
Ramganj
Banmankhi
Bhawanipur-Rajdhar
Dhamdaha
Gondwara
Nawabganj
PURNEAH
Kasba
Kadwa
Kumaria
Bahadurganj
Kishenpur
Dalkola
Balarampur
Manihari
Gangee R.
Kankai R.
Mahanadi R.
REFERENCES.
District.....PURNEAH
Tahsil.....RANIKPUR
Thana or Police Station...Balarampur
Town.....Nawabganj
Main Road.....
District Boundary.....
Tahsil ....do.....
Railway under construction.....
Traversed in advance up to 31st March 1888.....

III.—Chooraman Ward's Estate, Dinagepore.

47. The circumstances of this estate, and the reasons which led to a survey and settlement, are described on page 7 of the Annual Report of this Department for 1886-87. As there stated, the whole estate consists of 166,009 acres, of which the greater portion had been surveyed previous to 1886. It was determined to survey the remaining portions of the estate, amounting to 52,910 acres, and to prepare a record of rights under the Tenancy Act. The estate is held jointly by the Chooraman Ward and other proprietors.

48. The area to be surveyed comprises 197 villages, of which 114 were demarcated during the year. There were only five boundary disputes, of which four were decided.

49. The cadastral survey is being carried out by a non-professional party under Babu Nolin Chunder Ray. Survey commenced in May 1887. The figures given in Mr. Finucane's Annual Report last year gave the survey work of the season ending in June 1887. During the year 1887-88, 31,126 acres were cadastrally surveyed, leaving 21,784 acres to be completed, of which 14,713 were surveyed before the close of the season. The cost of survey operations during the year amounted to Rs. 10,779, at the rate of 5½ annas per acre. Although this rate is high, it appears that relative positions of professional and non-professional survey in respect of cost referred to in paragraph 25 of Mr. Finucane's Annual Report for 1886-87 have been reversed, and that the cost of non-professional survey has been cheaper than that of professional in the same district.

50. The records of 75 villages, comprising an area of 20,000 acres, were made over to the Settlement Department, and the work of recording rents and determining the status of raiyats were completed in 6,316 acres for 1,849 holdings. The raiyats were classified as follows:—

Settled raiyats ...	... 833	Non-occupancy raiyats	... 650
Occupancy raiyats ...	... 6	Under-raiyats ...	... 360

51. As the estate is to fall out of the management of the Court of Wards in three years' time, it was decided simply to record existing rentals, except where an alteration of rent could be claimed on any considerable addition of lands to holdings. The cost of settlement was Rs. 1,751 up to the 31st March. Now that the survey has almost been brought to a close, it is hoped that settlement work will proceed more rapidly.

IV.—Maldwar Wards' Estate, Dinagepore.

52. This estate lies in the Dinagepore and Purneah districts. There are 12 mehals, of which eight are in Dinagepore and four in Purneah; all but one of these are the exclusive property of the ward. In the one estate the ward's interest is greater than an 8-anna share. It was proposed at one time to make a survey under section 90 of the Tenancy Act, but it was found that the co-sharers would not join in the proceedings, and the attempt was abandoned. It was then determined to carry out a survey and record of rights under chapter X, as it was hoped that the estate would benefit by accurate measurement of its lands and the preparation of a regular rent-roll. The management of the Court of Wards will probably continue for 16 or 17 years.

53. The estate consists of 259 villages with an estimated area of 164 square miles. The operations commenced in December 1887 under Baboo Harish Chandra Rai, Special Deputy Collector, as settlement officer, while the cadastral survey was carried out by a detachment of the professional party engaged at Sunkerpore.

54. The boundaries of the villages were demarcated by the manager of the estate. There were no disputed boundaries. The area cadastrally surveyed up to the 31st March 1888 was 42½ square miles. In addition, the total area of the estate had been traverse surveyed. The cost incurred for survey up to the 31st March was Rs. 12,582. An effort is being made to complete the field survey by the close of the present season, but it is feared that the work will not be done at a lower rate than 5 annas per acre.

55. No progress was made in settlement work before the close of the year, when the record of only seven villages had been made over to the settlement

officer. The latter is endeavouring to arrange the terms of amicable arrangement between the landlord and tenants for the settlement of rents. The cost of the settlement operations is estimated at Rs. 17,486, of which Rs. 770 had been spent at the close of the year.

Survey and Record of Rights in Private Estates.

I.—The Dubalhati Estate, Rajshahye.

56. This estate is the property of Rajah Haranath Roy of Dubalhati in the district of Rajshahye. A dispute exists between the Rajah and his tenants regarding the rates of rent and the areas of raiyats' holdings, and petitions were filed early in 1887 by the Rajah and some of the leading raiyats praying for a survey and the preparation of a record of rights under the Tenancy Act. Under these circumstances a notification was issued under section 101, sub-section 2 (*a*) of the Tenancy Act directing the application of the provisions of chapter X to the estate. It was also hoped that some valuable statistics might be obtained regarding the cultivation of ganja, which is largely grown in the tract to be surveyed. Munshi Nundjee was directed to take up the work of survey and settlement as soon as he had finished the settlement of the Nulchira estate. The estates are estimated to contain an area of 31,870 acres, or nearly 50 square miles. There are 198 villages. Survey operations did not commence until March 1887, during which month the boundaries of 187 villages were demarcated. There were 119 boundary disputes, of which 21 were disposed of within the year. Cadastral survey did not commence till April 1888, and about 40 square miles were completed by the end of June.

II.—Kessiari Estate, Midnapore.

57. This estate is said to contain 4,818 acres with a mofussil rent-roll of Rs. 6,000. The survey was applied for by the proprietors on account of difficulties in their relations with their tenants. The survey was commenced at the close of December 1887, and the area surveyed up to the end of March 1888 was 2,960 acres at a cost of Rs. 1,488-12, of which Rs. 640 are put down as the cost for survey instruments, most of which will be subsequently recouped. Of the 41 villages of the estate, 40 had been demarcated. There were 54 disputes, of which 23 were disposed of during the year. The strained relations between landlord and raiyats have retarded the progress of the work.

III.—Purbopitpore alias *Purgopalpur, Midnapore.*

58. This estate contains 903 acres. Survey was commenced in March 1888, and by the close of the year 139 acres had been surveyed at a cost of Rs. 84-12 including Rs. 55 for survey instruments.

IV.—Purusthramupr, Midnapore.

59. This estate consists of one village of 477 acres. Measurements commenced in March 1888, and by the close of the year 160 acres had been surveyed at a cost of Rs. 85, including Rs. 55 for survey instruments.

V.—Bogri, Midnapore.

60. This estate consists of four villages with an area of 366 acres. Work did not commence till the end of March, when the survey of 80 acres had been completed at a cost of Rs. 126, including Rs. 98 for cost of survey instruments.

The four foregoing surveys are placed under Babu Bisheshur Banerjee, Deputy Collector.

VI.—Alakdia Durgapur, Tipperah.

61. The survey of this farm, which is held under the Maharajah of Hill Tipperah, was ordered under section 101 (2) in order to avert serious disputes existing between the tenants and their landlords. The farm comprises seven villages with an area of 774 acres. The survey is placed under Babu Kali Sunker Sen, but is not apparently under the supervision of this department.

CHAPTER II.

ANALYSIS OF DISTRICTS.

62. The inquiries which it was said in the last annual report were being made by Mr. Sakhawat Hosein in Dinagepore and Rungpore with a view to the preparation of a report on the agricultural practices of those districts were concluded early in the year. The report was prepared on the lines similar to that submitted by Mr. A. C. Sen for Burdwan in 1886, and the following matters of interests are extracted.

63. The soil of these districts is fertile and the water-supply sufficient. But the climate is unhealthy, and the people are physically weak. There is thus a scarcity of labourers, and a large area of cultivable land is lying uncultivated. The most important improvement in the agricultural condition of these districts would be to settle cultivators from some of the densely-populated Behar districts. The humid unhealthy climate of the place, however, prevents such immigration. The Rajah of Dinagepore, some years ago, secured some hundred families from Behar, and gave them every facility to settle. But in three years' time they all left the district.

64. Dinagepore is pre-eminently a rice-growing district, and some of the best varieties of rice are grown there. Carolina paddy was twice tried in Dinagepore, but with no satisfactory results.

65. Tobacco cultivation is the especial feature of Rungpore agriculture. Jute and sugarcane are grown in both the districts. Mustard is largely cultivated in Dinagepore. Indigo cultivation is a dying industry. Rhea cultivation was some twelve years ago tried on a large scale by the Rajah of Dinagepore, but the experiment failed owing to the absence of a proper machine for the extraction of fibre. To a very small extent *rabi* crops are grown, but the climate is not well suited for such crops. There is a small local silk industry, and the silk-worm known as *Eri* (*Philosamia Ricini*), which feeds on leaves of the castor-oil plant, is to some extent cultivated. In Rungpore there is a brown variety, from the silk of which a cloth of great durability is manufactured. If the growth of this species of worms, which are easily reared on the castor-oil plant, were encouraged, the supply might be greatly increased.

66. Of the new improved agricultural implements, the Behea mill is much used by the cultivators in Rungpore. In one estate alone, viz. Balashan, there were no less than 300 mills at actual work in one year.

67. The new Seebpore, the Birati cast-iron, and the Burrakur ploughs were shown at work in several places in both the districts. The new Seebpore plough showed most satisfactory work, and the cultivators admitted its superiority over the native plough. They, however, objected to the plough for its inverting the furrow and throwing the earth on one side only.

68. Manures are largely used in these districts, especially for sugarcane and tobacco. Cowdung is the chief manure in use. In sugarcane its ashes are applied and not the dung itself, as it is supposed to be injurious in its natural state. Oilcake is applied to *pán* (betel) and tobacco. Rotten mud from *jheels* is sometimes used for paddy. Manure is preserved with greater care here than in other districts. Cattle are herded on fields at night, especially on fields intended for tobacco or sugarcane cultivation. The mixing of soils with a view to improving their quality is also practised. For jute land, earth from fields of better soil is often applied in the same way as pond mud or manure.

69. There is no regular rotation of cropping practised. The cultivators, however, are not unaware of its benefits. Jute and paddy are generally grown alternately. But jute is not cultivated as largely as paddy, and the rotation is not always practicable.

70. It is difficult to ascertain the precise time when tobacco was introduced into the Rungpore district. There is evidence, however, to prove that it was known and cultivated in the district in 1782-83. The area under tobacco cultivation in Rungpore was estimated by Baboo Gopal Das, Special Deputy Collector deputed to collect agricultural statistics in 1872, at 71,204 acres, and the outturn at 5,21,315 maunds. Since that time there has not been any sensible addition made to this area. There are several varieties of the crop grown, chief of which are *ojainee*, *dese*, *hamaco*, and *chama*. Virginian seed was introduced in the time of the last famine, and it is probable that what the cultivators call *ojainee* or *bilatee* is

really *virginian*. There are two sub-varieties of *ojainee*, *ojainee proper*, and *dhakra ojainee*. The latter is of slightly inferior quality. *Dise* or *bhilingee* has four sub-varieties, viz., *bhilingee* proper, *mana bhilingee*, *shojonee bhilingee*, and *gatia bhilingee*. A large quantity of the tobacco is exported to Burmah for manufacture, though there seems no reason why the industry should not be carried on in Rungpore itself.

71. Mr. Hosien was transferred to the management of a ward's estate shortly after the commencement of the year, and was unable to take up the analysis of any other district. The only other agricultural officer, Mr. A. C. Sen, was occupied in supervising the experimental farms and in other inquiries connected with agriculture, and could only be deputed to the work of analysis for a short time. In consequence of orders contained in the letter of the Government of India, No. 219R-65-3, dated the 11th May last, the scope of the inquiries has been enlarged, and they will now be taken up systematically.

CHAPTER III.

COLLECTION OF RENT AND REVENUE IN PRECARIOUS TRACTS.

72. Under the orders of the Government of India, the consideration of this question is to be confined to districts which have been the subject of analysis. The scope of analysis has been extended, but a complete report has not as yet been submitted regarding any district. There is nothing therefore to report under this head.

CHAPTER IV.

MEASURES OF PROTECTION, INCLUDING ARBORICULTURE AND FODDER RESERVES.

73. Mr. Finucane visited the Rhotas plateau in the Khymore Hills during the cold-weather, and an officer of the Forest Department was deputed to meet him. The Forest Officer was, however, unable to arrive at Rhotas while Mr. Finucane was there, and the latter, having consulted with the Sub-divisional Officer of Sasseram, submitted a note on the subject of establishing fuel and fodder reserves on the plateau to the Collector of Shahabad. There appear to be no difficulties in protecting the forest tracts on the Rhotas and Reehul plateaus, as there are only two inhabited villages which could be removed, and it only remains to make rules for the management of the reserve. In addition to the two plateaus, of which Government is the sole proprietor, there is a large area over which Government exercises what are known as banskatti rights, or the right to collect and dispose of the spontaneous products of the land covered by the mehal, and to levy dues on such products, when collected by others, but not including proprietary rights in the land. It is proposed to reserve this area under the Forest Act, and the Forest Officer who visited Rhotas after Mr. Finucane had left, drew up, in consultation with the Sub-divisional Officer of Sasseram, a report regarding the measures to be adopted to protect trees and other forest produce in the reserve. The report is now under the consideration of the Forest Department.

74. Proposals were made by the Government of India to establish fodder and fuel reserves in suitable localities near lines of railways. Inquiries were made, but the plan was generally reported to be impracticable in Bengal, chiefly on account of the difficulty in acquiring land.

Planting of trees along road-sides.

75. The subject continued to receive the attention of the Department, and the further circular referred to in last year's annual report, containing detailed instructions for planting and preserving trees by roadsides and elsewhere, was issued. The instructions show the kind of trees which should be planted and the manner of planting, protecting and pruning. The Superintendent of the Botanical Gardens, Calcutta, informs me that many applications for seeds and seedlings were received during the year.

Reclamation of usar lands by planting trees.

76. It was noticed in last year's annual report that Mr. Maries, Superintendent of the Gardens of the Maharajah of Durbhunga, had succeeded in reclaiming lands impregnated with saline matter by planting them with rain-trees, such as *Inga Samam*, *Albizzia procera*, and others. Seedlings of these two were supplied during the year to district officers in Behar and Bhagulpore, but the results have not been reported. The soil in which Mr. Maries planted his trees has been analysed, but was not found to contain any remarkable quantities of saline matter. This was perhaps due to the collection of the soil after the heavy rain at the end of June, when the salt had been washed out.

Date-palm.

77. It was stated in last year's report that attempts were made to introduce the date-palm into Lower Bengal, but that the results were generally unsatisfactory. During the last year some seedlings were planted in Shahabad, and are growing fairly. Other plants have been reared from seed in the Hazaribagh district. It will probably be found possible to extend the cultivation of this palm in the drier districts of the Lower Provinces.

Divi-divi tree.

78. The Government of Bombay called the attention of this Department to the cultivation of the divi-divi tree (*Coesalpina coriaria*), from the pods of which an important agent in tanning is produced. Inquiries were made, and it was found that some experimental sowings had been made in the Kurseong and Buxa Forest Divisions, but had failed. The Deputy Commissioner of the Sonthal Pergunnahs reports that some trees grown from seeds sown in 1882 near Doomka are doing well, and that the soil appears to suit them.

Ipecacuanha.

79. Mr. Peppe, Manager of the Chota Nagpore Raj, has attempted the cultivation of the ipecacuanha plant in Ranchi, with seed from the Chinchona gardens. It is feared, however, that the climate will not be found suitable for its successful cultivation.

Eucalyptus tree.

80. Attempts are being made to introduce the eucalyptus tree into the Chota Nagpore Division. The seed germinated fairly under cover in Hazaribagh, but it is considered doubtful if the trees will thrive.

Eradication of disease among silkworms.

81. The inquiries and experiments noticed at pages 10 and 11 of last year's annual report regarding the eradication of "pebrine" among silkworms were continued during the year by Mr. N. G. Mukherjee. The first object of these inquiries was to ascertain the nature of the disease locally known as kata, which had led to a serious decline in the silk industry of Bengal. The disease was identified with that known in Southern Europe as pebrine, and remedial measures were adopted by the introduction of M. Pasteur's system of microscopic examination in order to detect the disease, and of healthy conditions in the rearing of cocoons. The success which attended the preliminary operations encouraged Government to sanction funds for carrying them on as a practical experiment, which should stimulate a demand for healthy seed among native rearers, and prove that the rearing of cocoons protected by M. Pasteur's system and under healthy conditions could be made a profitable commercial undertaking. It was felt that, considering the great depression in the silk industry, Government should take the initiative in the matter; but it is hoped that the business of the production and supply of healthy cocoons may in a short time be left to private enterprise.

82. The original experiments were carried out through a number of selected village rearers, and in October last Mr. Mukherjee summarised the results of the first five bunds as follows:—

1.—Microscopic selection carried on with reference to the multivoltine species of silkworms for four or five successive generations, by weeding out the diseased moths at each breeding season, establishes a breed free from disease.

*

2.—The necessity of the continuance of microscopic selection in every generation in certain centres to maintain the stocks healthy by rejecting any occasional pebrinised moths, is established. Silkworms appear to be naturally liable to pebrine, and individual caterpillars or moths in a pure stock may under adverse circumstances contract the disease.

3.—Microscopically-selected seed reared under healthy conditions gives a healthy crop. In the village nurseries, however, passed eggs, though yielding very good cocoons, do not, when used as seed, give better results than that obtained from any good seed cocoons ordinarily procurable in the district.

4.—Besides pebrine, other enemies of the silkworms are mice, lizards, spiders, ants, and, above all, the silkworm flies. The caterpillars can be preserved from all these enemies by rearing them in boxes fitted with wire-netting. By this means over 400 cocoons have been obtained from each lot of eggs laid by one moth, whereas in the village nurseries native rearers obtain from 40 to 80 cocoons from each lot of eggs, which again is reckoned a good outturn.

83. These results have pointed to a change of method in the experiments; and the sixth report shows that the new plan of rearing seed on a large scale in the disused Government barracks at Berhampore has been successful. Rearing in boxes fitted with galvanized wire-netting prevents harm from insects; and while 300 cocoons from each of the two wire-netting boxes were expected, 892 were obtained.

84. The January bund, however, was not so successful, as it was found that the building was too cold and draughty to allow the worm to ripen. The year's experiments, however, have shown that the system of microscopic examination improves the seed and increases the produce, assuming that rearing is carried on under normal conditions.

85. It has been recognized by the firms interested in the silk industry that the experiments conducted by Mr. Mukherjee have succeeded in obtaining a worm much freer from pebrine than the breeds of native rearers. It was felt, however, that much was still needed to make the system of selecting seed demonstrably profitable, and to adapt it to native requirements. There are also doubtful points in connection with silkworm rearing, which require elucidation. Under these circumstances an attempt was made to obtain the services of an expert from Europe, but the terms offered were found to be insufficient to induce a man with the necessary qualifications to come to India. It was then determined to depute Mr. Mukherjee to Europe to study the system of silkworm rearing in France and Italy, and he left India for the purpose at the commencement of April last.

86. The cost of the experiments have been met by contributions from the Government of India and the Bengal Government, and by subscriptions from firms interested in the silk industry, and native zemindars in the silk districts. The amount of such subscriptions already collected is Rs. 7,582.

Chapter IV (2) *Extension of communications and* (3) *Irrigation.*

87. These subjects are not dealt with in this Department.

CHAPTER V.

AGRICULTURAL EXPERIMENTS INCLUDING FARMS.

88. During the year the Department has had the services of only one Assistant Agricultural Officer, viz., Mr. A. C. Sen. He has assisted me with advice on agricultural matters, and has been mainly in charge of the agricultural experiments which are being carried on in the small farms at Dumraon, Burdwan, and Seebpore. The following is an account of the work of the Department in this direction during the year:—

Dumraon Farm.

89. This farm was started in 1886 by the Maharaja of Dumraon, and was originally intended to serve the purpose of a demonstration farm by bringing home to the native cultivators a knowledge of such agricultural practices as have previously been successfully tested in an experimental farm. This idea had, however, to be given up, because in Bengal no such experimental farm exists. A proposal is now under consideration to establish a farm at Bhojpur on a larger scale, the chief aim of which will be to make a profit.

90. Experiments were made during the past year on paddy, wheat, sugarcane, maize, and potatoes.

91. *Paddy.*—In consequence of the deficient rainfall in September and the first half of October, the experiments in manuring paddy were unsuccessful. The results show that in consequence of the adverse climatic conditions, the expenditure on manure was not recouped by an increased outturn. A comparison of manures showed that the best returns were obtained from the use of saltpetre and lime or saltpetre only at the rate of 2½ cwt. per acre. The use of lime alone was unsatisfactory. The results of deep ploughing showed no special increase in the outturn.

92. *Maize.*—Two plots placed side by side were sown, one with Canada maize and the other with a white variety of the country maize, in order to test their comparative merits. The Canadian variety was attacked a little before harvest time by white-ants, from which the country variety was free. The cause of this was traced to the fact that the plants as well as the grains of the Canadian variety are much sweeter than those of the country maize. The experiment has not given any conclusive result, and will be repeated.

93. *Potatoes.*—Experiments were made to test the comparative merits of a potato crop raised from ordinary country seed and from seed imported from Darjeeling. A piece of land was selected at Bhojpur within sight of potato fields belonging to the native cultivators. It was divided into two plots placed side by side, of which one was planted with country seed, and the other with seed potatoes obtained from the Revd. M. G. Wilson of the Rangaroon Valley, Darjeeling. Each plot was manured with cowdung at the rate of 60½ maunds per acre. The method of cultivation adopted was exactly the same as that followed by the neighbouring ryots. The results of the sowings were as follows:—

Plot No.	Variety.	Manures used per acre.		Price of manure.	Outturn per acre.	Value of the outturn.	Remarks.
			lbs.	Rs. A. P.	lbs.	Rs.	
6	Country ...	Cowdung ...	4,840	3 8 0	16,728·2	306·00	
7	Darjeeling ...	Do.	4,840	3 8 0	22,204·4	541·6	

94. *Wheat.*—Experiments on wheat were made on 27 plots, of which 24 are at the Dumraon farm and 3 are situated at Bhojpur. Three different series of experiments were tried, namely—

(1.) To ascertain the comparative merits of deep and shallow ploughing.

(2.) To ascertain the comparative merits of irrigation with canal and well water.

(3.) To ascertain the comparative merits of different varieties of manure.

The results may be stated shortly as follows:—

Deep ploughing gave an outturn of 150lbs. per acre over shallow ploughing, or an increase of Rs. 3-9 per acre.

Land irrigated with well water gave an outturn of 318lbs. per acre more than land irrigated with canal water, estimated to be equal to Rs. 6 per acre. The best manure for wheat was found to be saltpetre and ashes at the rate of 2½ cwt. of saltpetre and about 6 tons of ashes per acre.

95. *Sugarcane.*—The sugarcane crop on the Dumraon farm failed as in other parts of Shahabad. The failure is in this case attributed to constant cropping of the same land. Attempts are being made to supersede the common variety of mungo cane with that known as shamshara, and grown in Lower Bengal.

BURDWAN RAJ EXPERIMENTAL FARM.

96. This farm, which was started as an experiment some three years ago, has been made a permanent institution of the Burdwan Raj by Government order No. 257A, dated the 25th February 1888. Government has also given its consent to transfer the management of the farm to Mr. Reilly, one of the Managers of the Burdwan Raj, who will work in consultation with Mr. A. C. Sen.

97. The experiments with paddy were vitiated by deficient rainfall at the close of the season, and, as in Shahabad, the use of manure proved of little advantage under such conditions. The outturn was greater, but not sufficient to

cover the cost of the manure. So far as the experiment went, the use of bone-meal gave the best results. Some experiments were made with sugarcane, but no result of any special interest was obtained.

98. The following were the results of experiments with special crops:—

COTTON.

Name of the variety.	Yield per acre in lbs.	
	Last year.	Present year.
Nankin	370½	594
Lonacinu	468	270
Upland	136½	135
New Orleans	156	162

GROUND NUT.

Manure used per acre.	Price of manure.	Outturn per acre.	Price of outturn.
	Rs. A.	lbs.	Rs.
(1) Bone-meal ... 480 lbs. / Ashes ... 4,800 „	15 8	3,360	168
(2) No manure	.....	786	39

99. *Potatoes.*—An experiment was made in the cultivation of potatoes, which is thus described by Mr. Sen:—

"The method of cultivation adopted was that known in England as high farming, partly because the mode of cultivation followed in the best potato-growing villages in Burdwan and Hooghly is in the direction of high farming, and partly because from the results of experiments made in the farm, as well as from enquiries made of the best native cultivators, I am of opinion that the potato is one of those crops which the more liberal treatment they receive the more profitable do they prove. The field selected for the experiment is a coarse red sandy loam, such as is met with all over the Burdwan district. This was ploughed at intervals from May to the planting time in October. Cowdung rather fresh was applied in two instalments—once in July at the rate of 225 maunds per acre, and a second time in August at the rate of 75 maunds per acre. Bone-meal at the rate of 12 maunds per acre was sown broadcast and ploughed in a few days before the planting time. At the time of putting in the seeds, oilcake was applied at the rate of 6 maunds per acre. The result as tabulated below will speak for itself:—

Total cost of cultivation per acre.	Outturn per acre.	Money value of the outturn.	Nett profit per acre.
Rs. A.	Mds.	Rs. A.	Rs. A.
218 1	180	315 14	97 13

i.e., 44·8 of the capital laid out.

N.B.—In the above table cowdung has been valued at 2 annas a maund, and the price of seed potatoes has been set down at Rs. 8 a maund. The seed was obtained from Revd. Mr. Wilson of Darjeeling and was acclimatized English seed. The potatoes grown at the farm have been valued at Re. 1-12 a maund, which is a trifle less than the price actually realised."

SEEBPORE FARM.

100. This farm has been started with the ultimate object of attaching it to an agricultural educational institution. The land comprised within the farm, measuring about 20 acres, belongs to the Government Workshops, but it has been transferred to this Department under certain conditions. When the land was first taken up, it was in a very bad condition, overgrown with kash, ula, and other jungle. It has, however, at considerable expense and trouble, been brought into condition, and from the next rabbi season it will be possible to carry on systematic experiments. From the point of view of diffusing a knowledge of improved agriculture among ryots and others, this farm is very well situated. The ryots in the neighbourhood take much intelligent interest in its working, and it is often visited by educated men from Calcutta and its neighbourhood.

101. Experiments were made with potatoes, sugarcane, wheat and other crops, but no results of special interest were obtained. The value of saltpetre

as a manure for wheat and of a mixture of bone-meal and oil-cake was further demonstrated.

102. It was found that the fodder grass, "lataghas," mentioned as growing in Dacca in paragraph 28 of the last annual report, could be successfully cultivated on the banks of the Hooghly.

EXPERIMENTS THROUGH PRIVATE AGENCY.

103. As in previous years, a number of manure and other experiments were tried through ryots and zemindars with the object, not of obtaining accurate results which under the circumstances is almost an impossibility, but in the hope that if the cultivators themselves be convinced of the benefits to be derived from the use of any new manures or seed, they may adopt an improved system of agriculture. Over 50 ryots were induced to try the effect of different manures on paddy and sugarcane.

104. Owing to the great deficiency of rainfall last year, bone-meal did not give such good results as in the preceding two years; but that bone-meal is an excellent fertilizer has become fairly known among ryots and others interested in the matter. A demand for it has already been created, and an application has been recently received from one native gentleman alone for 50 maunds of it.

Agricultural experiments in Wards' and Government Estates.

105. In the Board of Revenue's report on the administration of Wards' and Attached Estates for 1885-86, it was proposed to utilize the agency of the Agricultural Department to facilitate the execution of beneficial works of agricultural improvement on Wards' estates. The Bengal Government approved of the proposal, and again in their Resolution on the Board's Land Revenue Report for 1886-87, they have directed that the agency of the Department should be used for the supervision of expenditure on improvements and for considering and summarising reports as to the results of agricultural experiments tried on Government estates. The question of the best manner of carrying out this policy has been under consideration during the year, but no definite conclusions have yet been arrived at. Meanwhile, as reported last year, a circular was issued to all Commissioners, suggesting a simple set of experiments which might be carried out in Wards' and Government estates, but with the exception of some petty experiments in Chota Nagpore and Arrah, nothing was done in the matter. In Hazaribagh the experiment of manuring rice lands with bone-meal and oil-cake gave most favourable results, as the improved outturn showed a net profit of 123 per cent. over the outlay. In the Khanika Wards' estate, Orissa, the cultivation of the potato has been successfully introduced.

Introduction of improved wheat seed.

106. Experiments were made in the cultivation of Buxar and Gya wheat seed in almost all the Divisions of Bengal. 154 maunds of Gya wheat and 213 maunds of Buxar wheat were distributed on application from Collectors, Managers of Wards' estates, and private landowners. Reports have been received of the outturn of the sowings and the result of the application of special manures. The results have not been satisfactory. In some cases the seed was not good; in others, the directions as to manuring were misunderstood, and in others the seed was received too late to germinate properly. The general result shows that Buxar and Gya wheat is not suited to Eastern and South-Eastern Bengal. Samples of produce from Furreedpore, Bogra and the Seebpore Farm, which have been reported on by the Committee of the Wheat and Seed Trades' Association, are said to have lost all the characteristics of Buxar wheat; while from Chittagong a local variety is found to be superior to that grown from imported seed. In spite of this fact there is still a demand for Buxar wheat seed from the zemindars and Collectors, and it is intended to continue the experiment.

Wheat trade.

107. The subject of the wheat trade with special reference to the question of refraction was discussed in a letter to the Government of Bengal, No. 1265 Agri., dated the 18th August. It was pointed out that the difficulty in obtaining clean wheat for exportation was due chiefly to the system on which wheat is bought

by the export merchant. Even if the grower supply clean grain, it is subject to the customary five per cent. refraction. The chief adulteration is with grains other than wheat, the result of sowing that crop intermixed with others. Government has been urged by merchants to issue advice to cultivators to improve the quality of their wheat by growing it alone. This, however, would, in the present condition of the wheat trade, entail an immediate loss on the cultivators, and Government has not felt justified in offering such advice.

108. With a view of testing whether it would be possible to obtain clean supplies of wheat by improvement in the native system of threshing, a steam-threshing machine was, with the assistance of Messrs. Balmer, Lawrie & Co., taken to Dumraon and an experiment made. The experiment proved that under the present condition of the wheat trade, the ordinary system of bullock-threshing would be more profitable to the ryot than steam-threshing, and further that the wheat was spoiled by the machines, many grains being broken in threshing.

109. It is contended by wheat merchants that they are unable to offer higher prices than according to custom for specially clean wheat, on account of the condition of the trade in Europe, where wheat is bought according to the average quality of the first few shipments, and not according to the special quality of each consignment. With a view of testing whether any change could be effected in the system, and what would be the value of the export of clean wheat as compared with that of the dirty wheat ordinarily procurable in this country, Messrs. Ralli Brothers obtained small parcels cleaned down to about three per cent., and shipped them to Marseilles. They were, however, unfortunately mixed with other consignments on arrival, and no results could be obtained from the experiment. The subject of the allowance on account of refraction was in March last again brought before the Bengal Chamber of Commerce, but no agreement was arrived at.

Agricultural implements.

110. *Ploughs.*—The question of supplying Bengal ryots with an efficient and cheap plough has occupied the attention of the Department for the last three years. The services of the Government workshops at Burrakar and Seebpore have been of great value in this direction. There have been five patterns of ploughs made at Burrakar and four at Seebpore. The Burrakar cast-iron ploughs are still in demand, although from the material and weight they are not considered altogether satisfactory. The price is Rs. 3-8, and 223 of these ploughs were sold during the year. It is tolerably certain, however, that cast-iron ploughs will never be a success. Of the four patterns made at the Seebpore Government workshops, the Seebpore wrought-iron inverting plough, mentioned in paragraph 62 of the last Annual Report, has been most favourably reported on. Mr. J. Crowdy of Durbhunga, who purchased over 20 of these ploughs for his own use and for distribution among ryots, wrote as follows:—"The Seebpore wrought-iron ploughs have proved a great success, and I am glad to say that ryots have taken to work them. They find they are just as light to draw as the common plough, and any cattle can be used. One ploughing with them, I consider, as good as six with the common ploughs." The ploughs were used constantly on the Seebpore Farm, and have worked satisfactorily. They can be drawn by ordinary country cattle, and are easily managed by natives. One hundred and twenty of these ploughs were distributed during the year. The price is Rs. 6-8.

111. *Water-lifts.*—The water-lifts after the pattern of the Cawnpore chain pump, which is made at the Burrakur Iron-Works, continue to be in demand, and during the year 77 were sold at a cost varying from Rs. 35 to Rs. 55 each. The pump, however, being made of cast-iron is liable to breakage, especially while in transit.

Utilization of Town Sewage.

112. In their circular letter No. 31H—36-4, dated the 10th March 1888, the Government of India requested that a brief note on the subject of the utilization of town sewage might be included in the annual report of this Department. The subject has already received attention. In 1885 a circular letter was sent to all municipalities in the Behar, Bhagulpore, and Burdwan Divisions, suggesting that the plan adopted for the disposal of night-soil and city refuse

in Monghyr might be introduced in all towns. The plan is for the municipality to hire a small portion of land. In Monghyr some fifteen bighas were hired at Rs. 5-8 per bigha. The land was divided into three farms so as to be close to the latrines. In each farm a portion of land is reserved for trenching every year. The whole patch of land manured during the year, excluding the reserved portion, is let on the 1st April each year to the highest bidder. When manured, it brings an average of about Rs. 14-8 per bigha. This system was recommended in 1885 to the Chairmen of all municipalities in Behar, Bhagulpore, and Burdwan. It was found on inquiry in 1886 that only four municipalities—Mozufferpore, Gya, Durbhunga, and Buxar—disposed of their night-soil in a useful and remunerative manner; while in Burdwan and in Bhagulpore two municipalities in each division had made arrangements for the utilization of their night-soil.

113. The correspondence was circulated to Chairmen of municipalities, and it appears from reports which have been received that the system of utilizing sewage has been introduced into six more municipalities in Behar.

114. The Dumraon Municipality report that they made a profit of Rs. 21 from reletting 8 bighas of manured land. In Patna the cultivators allow their fields to be used for trenching purposes, but will not openly pay a higher rate for them when manured. In Buxar profits to the amount of Rs. 84 were made by the reletting of manured lands. In Gya the profits amount to from Rs. 100 to Rs. 150 a year, and in Mozufferpore to about Rs. 120. In other municipalities the old prejudices have prevented the extension of the system. In Lower Bengal it appears that little action is taken to utilize sewage. The Howrah Municipality have not yet succeeded in carrying out any plans other than that of burial, but hope, when the new trenching ground is opened, to carry out on a large scale the system of trenching and cropping. It is reported that the question of cultivating and irrigating with sewage lands reclaimed by the Calcutta Municipility from the Salt Water Lakes, in order to prevent the discharge of the sewage into the natural streams of the country, has been under consideration since 1869, but has not been satisfactorily solved. The reclaimed land was leased out in 1879, and the lessee is said to have been fairly successful in the cultivation of table rice, fruit trees, fodder grasses, pulses, and fibres.

115. The total amount expended during the year on agricultural experiments was, apart from the cost of establishment, Rs. 7,070.

CHAPTER VI.

CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.

116. The subject remains almost in the same condition as it was when the report was submitted last year. This Department is still not in a position to do anything for the cure or prevention of disease in cattle, but district officers continue to report outbreaks of such diseases. The number of cattle reported to be attacked during the year 1887-88 was 2,436, of which 1,427 died. It is obvious, however, from the spasmodic nature of the reports that all outbreaks of disease are not brought to notice.

117. Inquiries were made during the year on the subject of horse and cattle-breeding operations in Bengal, and, as reported in Mr. Finucane's letter No. 559 Agri., dated the 20th March 1888, Commissioners of divisions were unanimously of opinion that little could be done in the matter of horse-breeding, but some private gentlemen and local bodies expressed their willingness to give assistance in co-operation with Government in improving breeds of cattle by the purchase of good bulls. The bull which, as noted in last years Report, was supplied to the Burdwan Raj is said to have failed in the object for which it was supplied.

118. The question of the measures to be adopted for the improvement of cattle-breeding is under the consideration of Government.

Sheep-breeding and the Wool Trade.

119. Inquiries were made during the year on the subject of the trade in wool in Bengal and the possibilities of improving the supply and quality of that article. The results were communicated to the Government of Bengal with Mr. Finucane's letter No. 1194 Agri., dated the 4th August 1887. It was proposed (1) to make arrangements by which a steady demand and sale could be

guaranteed for Thibetan wool in Darjeeling or elsewhere within British territories and (2) to make experiments in cross-breeding with Merino rams as a tentative measure in selected localities. The latter proposal was generally approved by the Government of Bengal, and two Merino rams were supplied to Mr. Abbott of Jaintpore Factory, Mozufferpore. He reports that, though the rams have not suffered from the climate of Behar, they refuse to herd with the native ewes. A ram was also supplied to the estate of the Maharajah of Cooch Behar, another to Mr. Peppe of Ranchi, and a third to Bhagwat Dyal Singh of Daltongunge, Lohardugga. The rams were imported from Australia at a cost of Rs. 692, and were sent up-country a little before the close of the year. It is too early yet to speak as to the success of the experiment.

120. Full inquiries were made through all districts in Bengal as to the prospects of improving the breed of sheep. The reports show that Bengal generally is unsuited to sheep-breeding, except in parts of the Chota Nagpore and Patna Divisions, where it is thought that the native sheep might be improved by cross-breeding. The whole subject is still under consideration.

CHAPTER VII.

AGRICULTURAL AND FISCAL STATISTICS.

121. As stated in the report for last year, a special report on the subject of the collection of agricultural statistics in Bengal was submitted to the Government of Bengal, and is still under consideration.

122. Forecasts of the wheat and jute crops were prepared during the year, and, it is believed, were found to contain fairly accurate information which was valuable to the trading community. The demand for these fore-casts among commercial men has considerably increased.

123. In accordance with the orders of the Government of Bengal, No. 408—9 Fam., dated the 8th February 1887, a scheme was drawn up for preparing statements, showing by figured estimates the outturn of the bhadoi or rain harvest, of the winter rice, and of the rubbi harvest, including special crops, such as sugarcane, tobacco, ganja, opium, and others. These statements were prepared with the object of putting Government in possession of early information regarding the state and prospects of the crops and the condition of the people in every sub-division of every district in Bengal. The result of the inquiries into the crops of the last season showed that the outturn of the bhadoi harvest was, generally speaking, about two annas below the normal, while the rubbi harvest was also deficient. It was not, however, found necessary to take any special measures of Government relief.

124. The difficulty of supplying accurate agricultural statistics in the Lower Provinces still remains, and the Government of India have recognised in their letter No. 219R—65-3, dated the 11th May 1887, that in the absence of village maps and records a complete analysis of districts with reference to agricultural matters cannot be given.

125. As reported last year, the Department continues to be indebted to the Calcutta Chamber of Commerce for the cordial co-operation and the ready aid afforded by them and by the Committee of the Wheat and Seed Trades Association, in all matters which have been referred to them in connection with the trade or agriculture of the province. The Agri-Horticultural Society also gave valuable assistance.

Chapter VIII. Trade and Trade Statistics.

126. These subjects are dealt with by the Revenue Department of the Government.

127. *Tours.*—During the year Mr. Finucane visited the following places :—

Dinagepore in connection with the Sunkerpore survey.

Mozufferpore and Dumraon in connection with the Mozufferpore survey and agricultural experiments.

Rajshahye and Moorshedabad for silkworm inquiries.

Ranchi and Hazaribagh for agricultural inquiries.

Pooree, Cuttack and Balasore in connection with the surveys in Orissa and Angul.

Buxar and Sasseram to make inquiries regarding the establishment of a forest reserve on the Rhotas plateau.

Durbhunga and Balua in Bhagulpore in connection with the Srinagar Court of Wards survey.

Delhi for the Conference under Sir E. Buck.

128. *Officers of the Department.*—Mr. A. C. Sen remained in the Department throughout the year, and Mr. A. K. Raye and Mr. D. L. Roy were employed for parts of the year. The former was employed in connection with the Angul settlement, and Mr. D. L. Roy in connection with the Srinagar Court of Wards settlement. The latter carried out the survey of a considerable tract, and showed diligence and aptitude for the work.

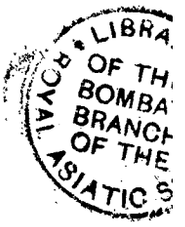
I have the honour to be,

SIR,

Your most obedient servant,

E. W. COLLIN,

Offg. Director of the Department of Land Records and Agriculture, Bengal.



W. J.—Reg. No. 5857J—504—13-8-88.

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